



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

GEOLOGY.

Rivers of North America.¹—A book with the comprehensive title *Rivers of North America* cannot fail to arouse interest among students of nature, especially when followed by the name of the author, Professor Israel C. Russell. Curiosity is felt as to how a subject so vast as this can be concisely treated by any writer, particularly by one who has obtained many of his conceptions at first hand through observation and study in the field. Of the many ways in which the rivers of North America might be discussed there occur to the mind two as especially distinct and important. The first is a geographic description of the position, length, volume, character of water, and other existing conditions; and the second might be an analysis from the geologic standpoint of the causes of these features or of the phenomena as noted along the course of each river. This latter form of treatment is that toward which Professor Russell has directed most of his investigations, and the book reflects largely the results of his field work. In fact his book might be classed as a primer of hydro-geology or hydrology, using this latter term as distinct from hydro-geography (hydrography), or the description of bodies of water. The hydrographic or descriptive part of the subject is not neglected, being included under the head of "Characteristics of American Rivers," but is subordinate to the thorough discussion of the why and wherefore of present conditions.

Professor Russell begins by showing that the surface of the earth is a scene of continuous change, the higher portions being gradually worn away and modified by the running waters, which, gathering into streams, make for themselves valleys proportioned to the various forces at work. Beginning with rock decay and removal of the surface debris, he passes on to discuss the laws governing streams, the limitation of downward cutting to base level, the influence of the hardness of the rock in producing rapids and waterfalls, and makes note of the material carried by the streams in visible particles or in solution. Passing from the destructive or eroding action of the rivers, he takes up their constructive features and shows how the alluvial cones and deltas grade from one into the other, and brings out the origin of the stream terraces, developing the fact that these, from the industrial standpoint, are among the most important resultants in the development of the country, since they furnish some of

¹ Russell, Israel C. *The Rivers of North America*. xix + 327 pp., 17 pls., 18 figs. New York, Putnams, 1898.

our best farm lands. Following this description of down-cutting and up-building, he brings out the effect of changes in the earth's crust by elevation and subsidence and by variations in climate, particularly through glacial action, and then having touched upon the principal points of hydrology he gives, as above noted, some of the characteristics of important streams, and, in conclusion, takes up the life history of a river, showing the principal events from youth to old age.

The conception is constantly kept before the reader that a river is a living thing working out its own life history, and that the apparently permanent features which we see are the temporary products of a restless and moving organism. The converse is also enforced that for every delta, terrace, curve, rapid, or fall of the river there is a definite cause, which may be sought and explained according to general law, and that the apparent anomalies may be reconciled if the student will patiently look into the subject.

The discussion of these natural laws, while necessarily somewhat abstruse, is rendered as interesting as possible by copious illustrations taken from well-known phenomena in the geography of North America. For example, as showing the importance of the glacial epoch upon the industrial development of New England, it is stated that manufactures were established there soon after the coming of Europeans, owing to the facilities offered by the numerous small water powers. These resulted from the disturbance produced in stream development by the débris left by the retreating ice sheet of the past geologic age. South of the glacial boundary, that is, south of Pennsylvania, water power is far less abundant and mostly within the inaccessible portions of the mountains. The development of manufacturing industries hence has been delayed and attention given more largely to agriculture, for which climatic and other conditions are more favorable. Thus a decided trend was early given to the New England character and manufacturing was so firmly established that although the water powers have relatively declined in importance, and steam has usurped their place, yet the glaciated regions of the United States still continue to lead in manufacturing. Here we have a direct relation between the effects of ancient changes in geography and modern growth of civilization.

Another striking illustration of the effect of geologic changes upon industrial development is given in the case of the drowned river — the Hudson — whose valley submerged by subsidence of the earth's crust has become a long narrow arm of the sea, where the tides rise and fall. During its early history the river cut its deep channel

across a mountain range as it was slowly being elevated, and continued its course far out into what is now the present ocean, to a point at least eighty miles eastward of Long Island. In late geologic time a downward movement of the earth's crust, too insignificant to be noticed in comparison with the whole diameter of the earth, has brought the former mouth of the river below sea level, and the salt water gradually encroaching has filled the broad valley where now is the important harbor of New York, and has made possible ocean navigation far inland. The influence of this easy route of communication up to the site of the present city of Albany, and from that point by easy paths up the broad Mohawk to the Great Lakes, determined the history, not only of New York State, but of the people of the continent, and has resulted in making this state the richest of the American Union.

F. H. NEWELL.

PETROGRAPHY.

The Volcanics of San Clemente. — San Clemente Island, off the coast of Southern California, is built up¹ almost exclusively of lava flows, volcanic breccias, and ash deposits. The principal eruptive is a pyroxene-andesite. In addition to this, there are smaller areas of rhyolite and dacite. The andesite consists of a mediumly basic plagioclase, augite, often hypersthene and magnetite as phenocrysts in a ground mass composed of the same minerals, with a larger or smaller proportion of glass. The dacite lies above the andesite, and the rhyolite above the dacite. The former rock contains the same phenocrysts as the andesite, but in the ground mass there is considerable quartz intergrown with oligoclase in micropoicilitic patches, and a large quantity of orthoclase, likewise in micropoicilitic intergrowths with the same plagioclase. The quartz and orthoclase appear to form the matrices in which laths of the plagioclase are imbedded.

The rhyolite is of an unusual type. It comprises phenocrysts of andesine, a few of hypersthene and magnetite, and an occasional one of augite in a microgranular and glassy matrix. The crystalline portion of the matrix is composed of quartz, orthoclase, and andesine, forming bands and lenses separated from one another by bands of glass.

¹ Smith, W. S. T. *Eighteenth Ann. Rep. U. S. Geol. Survey*, 1898, Pt. ii, p. 459.